Supercomputer System Operation Procedure

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Information Systems Division

Chapter 1   Objective

This document sets forth matters related to the system configuration, project categories, project reviews and the like for the supercomputer system ("System" hereafter) maintained and operated by the RIKEN Information System Division (ISD), based on Article 4 of the Supercomputer System Usage Policy ("Policy" hereafter).

Chapter 2   System Configuration

The system name is HOKUSAI BigWaterfall (BW), and the computational resources are as follows. There are some other experimental servers for testing and we will define how to use them separately.

Section 1   Computational Resources
1. Massively Parallel Computers (BW-MPC)
   - 840 node (33,600 core)
   - CPU: Intel Xeon Gold 6148 2.4 GHz, 40 core/node, 96 GB/node
2. Application Computing Server (ACS)
   - Large Memory Servers (ACSL) 2 node (120 core)
     - CPU: Xeon E7-4880v2 2.5 GHz, 60 core/node, 1.5 TB/node

Section 2   Storage
1. Online Storage System (5.0 PB)
2. Tape Archive System (7.9 PB: uncompressed, 4 TB/tape)

Chapter 3   Project categories

In accordance with Article 5 of the Policy, each user must designate a project and a project representative to use the system. There are two types of project: Quick Use and General Use, and they are valid until the end of the fiscal year.

Section 1   Calculation of computation time

"Computational resource" is calculated by [the number of all cores] x [time that the System can provide in a fiscal year]. "CPU core computation time" is calculated by the total of [the number of used cores] x [elapsed time] for all jobs

$$\sum_{i=1}^{all\ jobs}(the\ number\ of\ used\ cores \times elapsed\ time).$$ In use of large memory space,

memory space will be converted into CPU core computation time. For example, though a user's job use one (1) core and 1TB memory in the large memory server, the number of used cores will be converted one (1) core into 60 cores in a job accounting system.

Section 2   Quick Use

Use permission is given by the proposal review by the ISD Director. Approved user will be permitted to use CPU core computing time of 1% or less, and all Quick use users will be permitted to use CPU core computation time of about 10% of computational resources. "computational resources" of less than 1% in Quick Use is a maximum CPU core computing time in a fiscal year. A maximum computing time will be calculated by the day if project will be start from the middle of a fiscal year.

Section 3   General Use

Use permission is given by the proposal review. Approved users will be permitted to use CPU core computing time of 1% or more of computational resource. When a person who is new to the system applies for the first time, they should, in principle, apply for a Quick Use in advance and estimate the necessary computation time.

Section 4   Use of ACS

ACS are not subject to the review for General Use. All projects can use 1% of the total annual computing resources of ACS. Each project can apply for additional core computation time as needed, and can use up to 20% of the total annual computing resources.

Section 5   Job execution at lower priority

For efficient use of the system, computation time of are added to assignments that have exhausted their allocated computation time, with a much lower priority. Users are not required to submit an application.

Section 6   Continuing a project

A Quick Use project could be used again in the next fiscal year if the user requests to continue the project at the time of submitting a Usage Report at the end of the fiscal year. A General Use project could be continued to the next fiscal year's General Use project if it is submitted and approved. Otherwise, it could be continued to a Quick Use project. In these cases, the project number becomes a new one, and the area of storage being used continues to be available.

Chapter 4   Project Review

Section 1   Review of Quick Use

Quick Use projects shall be reviewed from time to time by the ISD director.

Section 2   Review of General Use

In principle, General Use projects are reviewed semi-annually (in March and September).

Section 3   Provisional Review and provisional allocation

If a project is expected to consume the maximum amount of computing resources, and there is a time gap before the next project review results for General Use are available, the ISD Director can provisionally approve permission to use up to a Quick Use project during the application period, after a provisional review by the Director after confirming the status of use of the proposal.

The results of the provisional review shall be reported at the next project review. If the application is approved, the computation resources used during the provisional permission shall be deducted.

Chapter 5   Job Operation and Priority Control

A system of priority control will be employed in order to allocate the computing resources fairly among the job operations of projects.

Section 1   Priority Control Method

Priority allocation between General Use and Quick Use projects will be conducted in an appropriate manner by the ISD operations team based on job operation needs. Every project must be managed so that computing resources are allocated as fairly as possible within the project.

Section 2   Priority Execution

Priority execution of jobs is set up as the subject of a usage fees, and these jobs shall take precedence over normal assignments for job execution.

Section 3   System Occupancy and Emergency Execution

When job operation requires exclusive use of the System, the ISD operations team will take necessary measures based on discussion between the users and ISD.

Priority control may be adjusted by the operations team, taking into consideration the job operation status of the entire System, when a special request is made to the ISD operations team by a project representative stating that computing resources are required urgently.

Chapter 6   Storage Usage

Section 1   Home Area

A flat amount of 4 TB of online storage space will be granted to each user as the home area.

Section 2   Data Area

The data area is an online storage area that can be used on a project basis, and user may apply for the required amount of space in TB units. If the amount of space is too large, it may be coordinated with other projects. The data area is subject to a usage fee.

Section 3   Tape Area

For the tape archive system, additional storage may be requested on a project basis, as with online storage described in the preceding paragraph. In principle, additional capacity may be granted in 8 TB increments up to 104 TB. As units are based on the capacity of tape cartridges, the units are equal to 4 TB $\times$ 2. Duplex tapes will not be provided initially. Users may request duplex tapes, but their storage allocation will be halved. Applications for expansion of the tape area will be accepted at any time. If the amount of space is too large, it may be coordinated with other projects.

Section 4   Managing Storage

Usage of storage will be calculated in a timely manner. Users of projects using less than the amount for which they applied will be asked about their usage plans, and unneeded capacity will be appropriated. However, users whose allocations have been appropriated may reapply to have their storage capacity increased, if needed.

Any data belonging to users whose project numbers have expired will be deleted from the System six months after the expiration of the project number. However, the area of storage subject to the usage fee does not guarantee the storage of data after use unless the user indicates an intention to continue using it.

When there is a need to transfer the data belonging to the user (for reconfiguring the System, for instance), ISD will make a request to users and their project representatives to delete, compress or consolidate their data. However, if the user and the project representative do not reply to repeated requests by email, ISD will delete and reprocess the data on its own accord.

Chapter 7   Registration for Use

Eligibility is defined by Article 3 of the Policy.

Section 1   User Registration

Registered users will be limited to those individuals that will actually log on to the System to operate programs or perform jobs. All applicants who are subject to Security Export Control Policies of the Japanese foreign exchange law have to be screened before user registration.

Section 2   Observer

Individuals who will serve only in a capacity to monitor the progress of the project may be registered as observers. Additionally, any registered users who are not operating programs or performing jobs on the System may apply to change their registration status from user to observer.

Chapter 8   Report

The project representative must submit a usage report, as stipulated in Article 15 of the Policy.

Section 1   Usage Report

The report is due at the end of the fiscal year or at the end of the project. The usage report must contain the content of the calculations/research, a summary of the knowledge gained, comments and the like, with attachments including a *research output list* and *reprints and other material*.

The research output list is to consist of the authors, paper titles, journal titles, publication dates, etc. of publications and oral presentations involving the research carried out using the System. Reprints and other material are to consist of reprints of the publications, presentation materials, conference proceeding and the like for those items given in the research output list.

Chapter 9   Usage Fees

In accordance with Article 5 of the Policy, usage fees are set for priority job execution and online storage usage.

Section 1   Services and Fees that are Subject to Usage Fees

The services and usage fees that are subject to usage fees are defined in the Handling of Usage Fees for Information System Services Provided by the Head Office for Information Systems and Cybersecurity.

Section 2   Priority Execution

Priority execution in Chapter 5, Section 2 is subject to the usage fees. Unused computation resources allocated to project is subject to priority execution. The right to perform priority execution is valid until the end of the fiscal year, and no refunds will be made for unused computation resources.

Section 3   Data Area

The data areas in Chapter 6, Section 2 is subject to a usage fee. Users can apply the capacity to use for the project. The application period, in principle, is until the end of the fiscal year.。

Section 4   Application and Payment Representative

When using a service that is subject to a usage fee, a payment representative must be established in accordance with the Procedure. The payment representative should be a supervisor (in a managerial position of Chief Scientist, Team Leader, Unit Leader or higher). The payment representative shall make an application to the ISD director for services subjected usage fees with a payment method.

Chapter 10   Others

In addition to these guidelines, other materials necessary for the use and operation of the system will be provided separately by the ISD Director.